FAQ's In Shielded Metal Arc Welding Welding (SMAW)	
Sr. No.	**Question and Answers**
1	**Why redrying is not required for the E6013 electrodes?**
	E6010, E6011, E6012 & E6013 type electrodes delivers high amount of hydrogen in the weldmetal. Redrying will not make any changes in the weld hydrogen level & it will weaking flux bonding to the wire. So, Redrying required for cellulosic & Rutile based electrodes.
2	**What is difference between synthetic & non synthetic electrode?**
	Synthetic electrode: Electrodes core wire chemistry will differ from the undiluted weld metal chemistry Non synthetic electrode: Electrodes core wire chemistry will be same of the undiluted weld metal chemistry
3	**What is difference between MMAW & SMAW?**
	Both are indicating the same process called stick electrode welding & name implies from the different countries / Standard MMAW : Manual metal arc welding - ISO Standard / European Union SMAW : Shielded metal arc welding - AWS Standard / USA
4	**Why E7018 electrodes are required to be redried before welding? What is redrying temperature & holding time?**
	E7018 electrode is the basic coated electrode, which ensure low hydrogen weld deposit when properly Redried. Redrying temperature is 250 - 300°C & Holding time is 1 Hr or refer the manufacturer recommendation.
5	**Why there are multiple brands for any AWS class electrode?**
	a) Based on coating thickness b) Based on metal deposition efficiency c) Based on weld chemical / mechanical requiremnt by customer other than AWS requirement d) Based on 3rd party approvals
6	**What is the reason of flux coating cracking issue?**
	a) Excessive redrying or Multiple redrying cycles b) Improper handling c) Fluctuations in the redrying oven temperature d) Common in Austenitic stainless steel wire (High Co-efficient of thermal expansion) used coated electrodes.
7	**When is it required to redry the E6013 electrodes? and at what temperature?**
	If E6013 electrodes have been exposed to high humidity, rain, or any conditions that could introduce moisture, redrying may help to restore their performance. Redrying temperature is 80 – 100 °C for 30 Min.
8	**What is deposition efficiency of electrode?**
	It is a measure of how much of the electrode's weight contributes to the weld metal compared to how much is lost (through spatter, vaporization, or other means). A high deposition efficiency indicates that a greater proportion of the electrode material is used in the weld, leading to less waste.
9	**How does the deposition efficiency of welding electrode is measured?**
	Ratio of Weight of deposited weld metal and the weight of actual core wire used for the deposition.
10	**What is the effect of higher deposition efficiency in terms of weld quality and positional welding characteristics?**
	Higher deposition efficiency welding electrodes limited to flat & horizontal welding positions
11	**How does the welding electrode diameter is selected in reference to the base metal thickness?**

	Higher diameter electrodes are recommended for thicker plate.
12	**What is the normal arcing time in 8-hour shifts for SMAW Welding?**
	It depends on the welder & Job nature. Normally it was 3 Hrs in 8 Hrs shift.
13	**Why are 4 mm electrodes generally not recommended for vertical up welding?**
	4 mm electrodes required, high current & it was difficult to control the weld pool in vertical up welding.
14	**What is deposition rate of electrode?**
	Amount of weld metal deposited per hour is called deposition rate (kg/ hr).
15	**What is the deposition rate (kg/Hr) per arc hour of 4 mm E7018 electrode?**
	Generally, 1.5kg/ Arcing hour.
16	**What are the common points to be looked in to prior to the welding ?**
	a) Welding process Selection b) Safety Precautions - Personal Protective Equipment (PPE) & Ventilations c) Equipment and Tools Preparation d) Material Preparation - Surface cleaning & Fit up e) Welding Parameters – Current , Voltage & Travel Speed as per WPS f) Inspection of job g) Preheat if required
17	**Which diameter electrode is normally preferred for the root run welding in pipes?**
	2.5 mm electrode
18	**How many times an electrode can be redried and used?**
	3 Times
19	**What is the common size of welding electrodes for pipe? What are their selection criteria?**
	Normally 2.5 and 3.15mm diameter electrodes are recommended. Depending on position, grade & type of welding either E6010 or E7010 or E7016 class electrodes are used.
20	**What is the convexity of weld bead?**
	Convexity is defined as the maximum distance from the face of a convex fillet weld perpendicular to a line joining the weld toes.
21	**How convexity is measured and what are it is acceptance criterion?**
	Generally, it is 2.5mm max. However, size-wise details we have to refer the relevant specification.
22	**Is grinding allowed for the preparation of weld assembly?**
	Yes, grinding is commonly used and often allowed for the preparation of weld assemblies, but there are specific guidelines and considerations to follow to ensure it is done correctly and does not negatively impact the weld quality. After grinding, inspect the surface for any defects or issues that may need to be addressed before welding. This includes checking for proper edge preparation and ensuring there are no residual contaminants.
23	**What is the quantity of electrodes required for one metre of fillet Weld?**
	It depends on the size of fillet and type of electrode – its diameter & length.
24	**What is the run-in and run-out plate and why it is important?**
	Run-in and run-out plates are temporary pieces of material used at the beginning and end of a weld to improve the overall quality and consistency of the weld. They help in managing the start and end points of the weld to avoid common defects, ensure a smooth transition, and achieve a high-quality final weld.
25	**What are the acceptance criteria for fillet weld?**
	Fillet weld size should meet the required size Free from welding defects like cracks & porosity
26	**What are the different types of electrode coating? & What are the significant?**
	Electrode coatings are classified as Cellulosic, Rutile, Basic & Iron powder + Basic coating.

	Cellulosic : Good penetration & suitable for Pipe welding root run Rutile : Suitable for low OCV AC, good weld control & better slag detachability Basic : Better mechanical properties & Low temperature impact toughness Iron powder + Basic coating : Better metal deposition efficiency
27	**What type of welding machine/power source is required for the continuous welding of 4 mm diameter welding electrode?**
	CC type power source required for SMAW process
28	**What is the ill effect of not maintaining inter-pass temperature?**
	High interpass temperature leads to grain growth & affects the impact toughness property
29	**Why preheating is required and how does the preheating temperature is selected?**
	Preheat controls the weld metal cooling rate & it will improve the weld ductility by reducing weld hydrogen level, residual stress & controlling hard microstructures. Preheat temperature selection depends upon the plate thickness, Joint design, base metal carbon content, alloy content & Carbon equivalent number.
30	**When PWHT is required?**
	It was depend up on the fall of the weld ductility & development of resuidual stress in the weld joint.
31	**When under bead porosity comes?**
	1. Difference in the gas solubility limit in the liquid phase of the metal is very higher than solid phase of the metal 2. Solidification range of the alloy / metal should be small.
32	**Common causes of cracks in SMAW welding?**
	Hot Cracks : 1. Improper welding electrode selection 2. Contaminated or high sulphur/ Phosphorous base metal Cold Cracks : 1. High hydrogen in the electrode 2. Poor storage or redrying issue in the low hydrogen electrode 3. Poor preheat temperature selection & technique 4. Material thickness & joint configuration 5. Improper PWHT
33	**Why sometimes same electrodes colour appearance differs, does it affect the quality of weld and performance?**
	Minerals used in electrode manufacturing are naturally occurring and sometimes there is some difference in colour based on location of mines. This phenomenon cause variation in colour of the end product. However, properties do not differ.
34	**Can half-burnt electrode be reused?**
	Generally, yes.
35	**Is it recommended to use electrode with broken flux?**
	No, it will make the weld quality & metallurgical issues in the weld.